

REMARKS

The application has been amended and is believed to be in condition for allowance.

The specification has been amended to add section headings and to correct a spelling error.

Claims 1-14 were examined.

Claim 15 is new and is based on claim 1 and the disclosure beginning at specification page 5, line 16. Claim 16 is based on claim 14 and the corresponding specification portions. Claims 17-18 correspond to claims 15-16, reciting the invention as a computer readable storage medium tangibly embodying a program of instructions executable by a computer to control the computer to function for extracting a geological horizon and related properties from a seismic representation.

Reference is made to specification page 5 beginning with line 19, and the application drawing figures. In Figure 1, a three-dimensional seismic matrix is obtained by picking up the measurements registered by the geophones G_{ij} disposed on a network x, y at coordinate points i, j . The pickup of these samples measurements time-wise is represented along a descending axis t representative of the depth of a vertical descending from the surface of the ground or of the sea. The measurements are characterized by their amplitude, for example an amplitude picked up by the geophone G_{ij} with time or at the sampling depth t_k .

The discrete measurement carried out by the geophone G_{ij} in time or at depth t_k is called the seismic amplitude $S_{ij,k}$.

The assembly of seismic amplitudes corresponding to a geophone G_{ij} of coordinates i, j is a one-dimensional matrix $(S_{ij1}, S_{ij2}, \dots, S_{ijk}, \dots, S_{ijN})$ called a discrete seismic trace, because this one-dimensional matrix corresponds to the trace according to the point of horizontal coordinates i, j of the three-dimensional seismic matrix obtained by seismic measurements.

The vertical axis t oriented along a descending vertical designates usually the time, but can also be considered to represent a depth from the surface.

From the discrete seismic trace located on the vertical of a geophone G_{ij} , there is defined, by interpolation or approximation, discrete values about $t - t_k = k$, a continuous function $S_{ij,k}(t)$ which is designated as the "continuous local seismic trace." The claims recite constructing a continuous function can also be applied to the present invention to provide a "continuous local seismic trace". See new claim 15.

This method thus permits displaying the seismic attribute on the extracted horizon by painting it with corresponding colors. See new claim 16 and claim 14. See specification page 11, lines 26-28.

Lastly, see page 13, lines 1-11 which disclose that the process according to the invention is preferably practiced with a

device comprising suitable means for practicing the steps described with reference to Figure 6. In particular, a device according to the invention comprises memory means needed for the successive computations and the visualization means necessary for step 107. Preferably, a device according to the invention is a programmable device controlled by computer software comprising program code elements to execute the steps of the process described with reference to Figure 6.

Claims 1-14 were rejected as being directed to non-statutory subject matter and therefore not complying with section 101.

The claims have been amended to comply with section 101. See claim 1 and claim 14, as well as the new claims. Withdrawal of the rejection is solicited.

See Figures 1-2 and the specification beginning at page 5, line 16.

Claims 1-14 were rejected under section 103 as obvious over HILDEBRAND 5,615,171 in view of VAN RIEL 6,665,615.

Applicants respectfully disagree.

HILDEBRAND fairly discloses a method/apparatus for finding horizons in 3D seismic data. See that the HILDEBRAND Abstract discloses associating each descendent picked point with a parent seed point is disclosed which is used in a computerized method of automatically picking horizons from a three dimensional volume of seismic data traces. Such association of each and every

point to each of its descendent picked points is recorded in computer memory, and displaying a path from a descendent picked point back to a starting seed point which led to its selection as a picked point.

The Official Action acknowledges that HILDEBRAND does not teach the recited step of using as optimum (vertical) offset of two adjacent continuous local seismic traces, the value of offset rendering the maximum their correlation function, this optimum offset being not necessarily a whole number multiple of the vertical sampling interval. See Official Action page 3, last paragraph.

The Official Action states that this feature is well known, and offers VAN RIEL for teaching this step.

Applicants respectfully disagree.

VAN RIEL does not teach the recited step. VAN RIEL does not teach a method of estimating elastic/compositional parameters from seismic and echo-acoustic data. See the VAN RIEL Abstract disclosing a method for determining from measured reflection data on a plurality of trace positions, a plurality of subsurface parameters by preprocessing the measured reflection data into a plurality of partial or full stacks; specifying one or more initial subsurface parameters defining an initial subsurface model; specifying a wavelet or wavelet field for each of the partial or full stacks of the measured reflection data; calculating synthetic reflection data based on the specified

wavelets and the initial subsurface parameters; optimizing an objective function, including the weighted difference between measured reflection data and synthetic reflection data for a plurality of trace positions simultaneously; and outputting the optimized subsurface parameters.

These teachings are not related to HILDEBRAND, or the present invention, such that one of skill would look to VAN RIEL in modifying HILDEBRAND.

The Official Action states that one of skill would combine VAN RIEL with HILDEBRAND in order to obtain optimal offset data by correlating relevant trace for property extraction as claimed. See Official Action page 4, lines 3-5.

This reasoning is classic hindsight. In making an obviousness rejection, the motivation must be found in the prior art and not from the present application being examined. Here, the Official Action is looking at the claims in order to determine how the prior art could be combined. This approach is inexpressible hindsight.

Note first that offset data is not mentioned in HILDEBRAND.

Again, HILDEBRAND does not even mention offset and there is no reason HILDEBRAND would teach the recited step of using as optimum (vertical) offset of two adjacent continuous local seismic traces, the value of offset rendering the maximum their correlation function, this optimum offset being not

necessarily a whole number multiple of the vertical sampling interval.

The Federal Circuit has held that in determining the differences between the prior art and the claims, the question under 35 USC 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 218 USPQ 871 (Fed. Cir. 1983).

The present inventors have found using as optimum (vertical) offset of two adjacent continuous local seismic traces, the value of offset rendering the maximum their correlation function, this optimum offset being not necessarily a whole number multiple of the vertical sampling interval. This teaching is not within the insight of the prior art as to what HILDEBRAND was determining.

As the insight needed to achieve the claimed invention is not suggested by the references, the overall method effectuating the invention would not have been obvious to one of ordinary skill in the art.

Additionally, the motivation offered in the Official Action does not suggest the desirability of the combination.

The Federal Circuit has held that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests

the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

As discussed above, that VAN RIEL teaches about offset data does not, in and of itself, suggest that this would be useful in the HILDEBRAND method.

The focus of an obviousness rejection is not whether the prior art had the pieces to enable the present invention, but is whether the present invention was obvious in view of the prior art teaches and experience.

Any motivation to modify HILDEBRAND is merely hindsight where the present disclosure is effectively being used to render the claimed invention obvious. Such an approach is not permitted. The Federal Circuit emphasized in July, 1998 that "[m]ost, if not all, inventions are combinations and mostly of old elements." *In re Rouffett*, 47 USPQ 2d 1453, 1457 citing to *Richdel, Inc. v. Sunspool Corp.*, 219 USPQ 8, 12 (Fed. Cir. 1983). The Federal Circuit continued by noting that "rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blue print for piecing together elements in the prior art to defeat the patentability of the claimed invention."

Thus, the Federal Circuit requires that in order to prevent the use of such hindsight, the Official Action must "show reasons that the skilled artisan, ... with no knowledge of the claimed invention, would select the elements from the cited prior

art references for combination in the manner claimed." (*In re Rouffett* at 1458). The present rejection fails to meet this requirement.

As stated by MPEP §706.02(j), to establish a *prima facie* case of obviousness the Official Action must first, consider the relevant teachings of the prior art, and after determining the differences between the pending claim and the prior art teachings, second, propose modifications of the prior art necessary to arrive at the claimed subject matter, explaining the motivation for combining the particular references and making the proposed modifications to those references. Thus, there must be motivation to modify the references and a teaching or suggestion of all the claim recitations. This motivation must not be merely *pro forma*.

VAN RIEL and HILDEBRAND

The applied art does not involves two simple mechanical devices with interchangeable parts that can be swapped one for another, or added on from one patent's teachings to the other patent's teachings.

The present claims are believed non-obvious for each of the following reasons.

The present situation is not a patent application for a combination which only unites old elements with no change in their respective functions. See (KSR International Co. v.

Teleflex Inc. Slip Opinion No. 04-1350 Decided April 30, 2007)
citing to Great Atlantic & Pacific Tea (1950).

Further, the present application is not directed to a method already known in the prior art that is altered by the mere substitution of one element for another known in the filed. KSR citing to U.S. v. Adams.

In the present situation, one of skill would not see there was any "apparent reason" to combine the offset data teaching from VAN RIEL with the technique of HILDEBRAND. Indeed, the current rejection is non-specific and conclusory. There is no detail as to how the VAN RIEL would actually, and beneficially, be adapted to HILDEBRAND.

The correct test, as articulated by KSR, is to ask whether a person skilled in the art starting with HILDEBRAND would have found it obvious to incorporate the offset teaching from VAN RIEL.

It is not enough to simply conclude that it would be obvious to make such an incorporation. KSR requires more than a summary analysis. KSR requires "this analysis should be made explicit ... There must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness."

There being no articulated reasoning, the present obviousness rejection is not viable and appears based merely on hindsight.

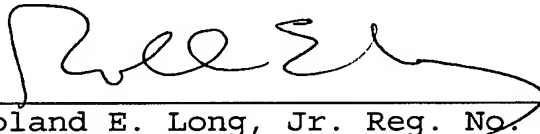
Reconsideration and allowance of all the claims are respectfully requested.

Should there be any matters that need to be resolved in the present application; the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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